Cisco 2950 Switch

Device Installation and Service Manual

Part Number M3185-91914
Printed in the U.S.A. February 2005
Edition 2

PHILIPS

About this Manual

Proprietary Information

This document contains proprietary information, which is protected by copyright. All Rights Reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

Philips Medical Systems
3000 Minuteman Road
Andover, MA 01810-1085
(978) 687-1501

Printed in USA

Warranty

The information contained in this document is subject to change without notice.

Philips Medical Systems makes no warranty of any kind with regard to this material, including, but not limited to, the implied warranties or merchantability and fitness for Philips Medical Systems shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Copyright

Copyright © 2004 Koninklijke Philips Electronics N.V.

All Rights Reserved

Windows NT, Windows 98, and Windows 2000 are registered Trademarks of Microsoft Corporation.

Printing History

New editions of this document incorporate all material updated since the previous edition. Update packages may be issued between editions and contain replacement and additional pages to be merged by a revision date at the bottom of the page. Pages that are rearranged due to changes on a previous page are not considered revised.

The documentation printing date and part number indicate its current edition. The printing date changes when a new edition is printed. (Minor corrections and updates that are incorporated at reprint do not cause the date to change.) The document part number changes when extensive technical changes are incorporated.

Second Edition.....February 2005

First Edition..... November 2004

Text Conventions

The following conventions for Notes, Cautions, and Warnings are used in this manual.

Note — A **Note** calls attention to an important point in the text.

Caution — **A Caution calls attention to a condition or possible situation that could damage or destroy the product or the user's work.**

Warning — **A Warning calls attention to a condition or possible situation that could cause injury to the user and/or patient.**

Explanation of Symbols

Symbols on products and packaging mean the following:

Defibrillator-proof type CF equipment

Caution: Consult accompanying documents.

Signal (ECG) Input

Signal (ECG) Output

Data input/output

Alternating Current

 Direct Current

Protective earth

Equipotential grounding post

Temperature

Humidity

Altitude or atmospheric pressure

Contains parts to be recycled

Contains parts that may not be put into normal waste disposal but must be recycled or dealt with as chemical waste

Fragile, handle with care

Keep dry

Consult instructions for use

Date of manufacture

Serial number

Catalog number

Batch code

Table of Contents

About this Manual 1-2
Proprietary Information 1-2
Warranty 1-2
Copyright 1-2
Printing History 1-2
Text Conventions 1-3
Explanation of Symbols 1-3

Introduction 1-1
Purpose 1-1
Ordering Information 1-1
Cabling Installation Materials 1-1
Specifications 1-2
Physical 1-2
Environmental 1-2
Electrical 1-2
Regulatory 1-3
Philips Hardware 1-3

Hardware Description 2-1
Front and Rear Panels 2-1
Cisco 2950 2-1
Controls and Indicators 2-2
Cisco 2950 2-2

Software Description 3-1
Cisco 2950 3-1
Firmware 3-1
Switch configuration 3-1

Installation 4-1
Network Component Installation 4-1
Physical Installation 4-1
Switches 4-1

Troubleshooting the Clinical Network 5-1
Overview 5-1

Maintenance 5-2
Routine Maintenance 5-2
Air Intakes 5-2
Reload Firmware 5-3
Single Switch Firmware restore 5-3
Switch to Switch Firmware restore 5-6
Re-configuration 5-8
Switch configuration 5-8
Network Statistics 5-10
Error Codes and Definitions 5-11
Incrementing Counter Errors 5-11
LED Diagnostics 5-12

Testing Product Assurance 6-1
Testing Product Assurance 6-1
Visual Tests 6-1
System Components 6-1
Cables 6-1
Connectors 6-1
Test and Inspection Procedures 6-1
Clinical Network 6-2

1 Introduction

Purpose

The Cisco 2950 is used in the IntelliVue Clinical Network and the IntelliVue Wireless Network as a Core or a Tier switch. Specific settings must be configured depending on the application of the switch, these settings are defined in “Switch configuration” on page 3-1.

Ordering Information

Option	Description
862161	2950 UTP Switch

Cabling Installation Materials

Cabling installation materials are ordered under Product # **M3199AI**.

Table 1-1. M3199AI Passive Components for M3185 Clinical Network

Option	Description
UTP Cable	
P01	305 m (1000 ft.) Unshielded Twisted Pair (UTP) plenum cable (Cat. 5, Orange)
Patch Cables	
J10	0.9 m (3 ft.) UTP Patch Cable
J11	2 m (7 ft.) UTP Patch Cable
J12	3.7 m (12 ft.) UTP Patch Cable
J20	3.7 m (12 ft.) UTP Crossover Cable
J21	0.9 m (3 ft.) UTP Crossover Cable
J30	3.0 m (9.8 ft.) Fiber Optic Patch Cable - ST/ST
J31	3.0 m (9.8 ft.) Fiber Optic Patch Cable - SC/SC
J32	3.0 m (9.8 ft.) Fiber Optic Patch Cable - ST/SC
Patch Panel Kits	
A01	24-Port Patch Panel Kit
A05	Patch Panel Wall Mount Kit
Wall Box Kits	
A10	Dual Port, single gang, RJ-45 UTP Wall Box Kit (US only)
A11	Dual Port, single gang, RJ-45 UTP Surface Mount Kit
A12	Quad Port, dual gang, RJ-45 UTP Wall Box Kit (US only)
A13	Quad Port, dual gang, RJ-45 UTP Surface Mount Kit

Specifications

This section gives physical, environmental, electrical, and safety specifications for the 2950 Switch.

Caution **The following specifications are for units shipped at the time of this manual's publication. Units shipped with later systems may vary, with newer models substituted as they become available.**

Physical

Philips Component	Product Part #	Height cm (in.)	Width cm (in.)	Depth cm (in.)	Weight kg. (lbs.)
Cisco 2950 Switch	862161	4.6 (1.8)	44.2 (17.4)	20.3 (8.0)	2.7 (6.0)

Environmental

	Product Part #	Temperature	Relative Humidity (Non-condensing)
Philips Components			
Cisco 2950 Switch	862161	32 - 131 ^{o}F 0 - 55 ^{o}C	15 - 95% @ 40 ^{o}C

Electrical

Philips Component	Product Part #	Input Voltage (VAC)	Manual Switching Required?	Input Frequency (Hz)	Dissipated Power (max) (Watts)
Cisco 2950 Switch	862161	100 - 127 200 - 240	No	50 - 60	36

Regulatory

Philips Hardware

The Cisco 2950 switch complies with IEC 60950, CISPR 22 Level A, and EN 50082-1. They carry CE- marking to the European Low Voltage and EMC Directives.

Warning **Information Center system components are not suitable for installation in the Patient Care Vicinity (Patient Environment) -- any area within 1.5 meters (4.9 ft.) horizontally and 2.5 m (8.2 ft.) vertically above the floor from any patient care location in which medical diagnosis, monitoring, or treatment of the patient is carried out.**

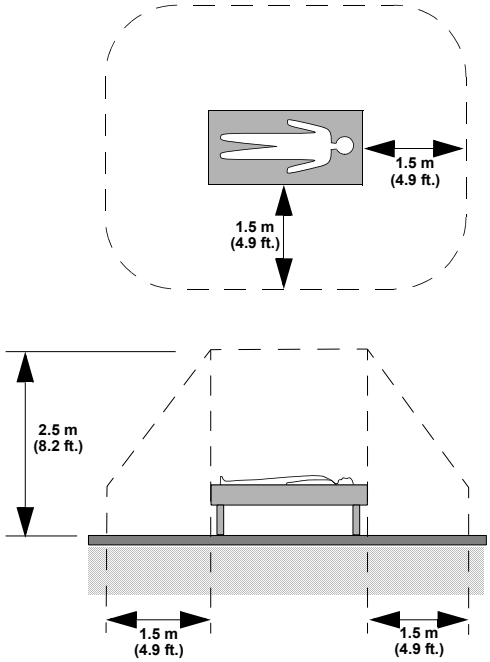

Figure 1-1 Limits of the Patient Environment

2
Hardware Description

Front and Rear Panels

Cisco 2950

24-port Network Switches are used to route patient monitoring data among the devices on the Clinical Network. It "reads" incoming data from network devices -- Patient Monitors, Information Centers, the Server, another Switch -- and routes them to their destination devices -- other Information Centers, the Server, Printers.

The Cisco 2950 switch used is rack mountable. Its front panel has 24, 10/100 MBit/s RJ-45 ports and two 100Base-FX ports.

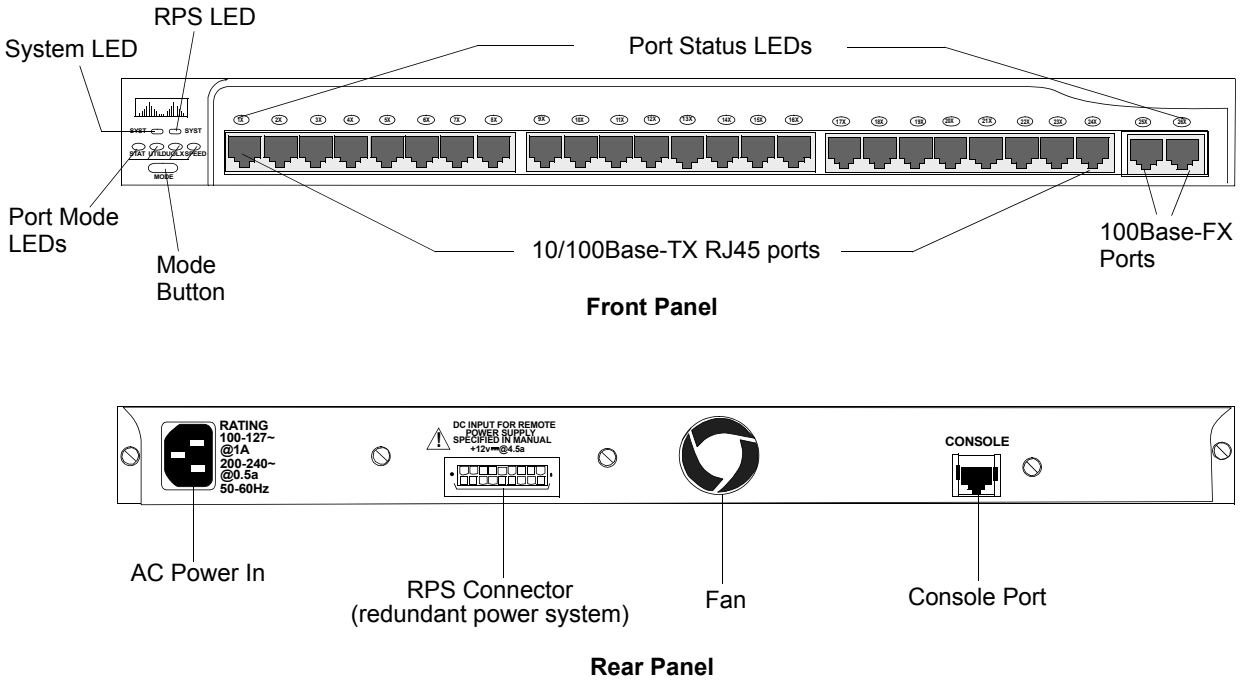

Figure 2-1 Cisco 2950 Network Switch

Controls and Indicators

Cisco 2950

The Cisco 2950 Switch contains a number of LEDs on its front panel that can be used for diagnosing switch problems. Figure 2-2 shows the locations of these LEDs.

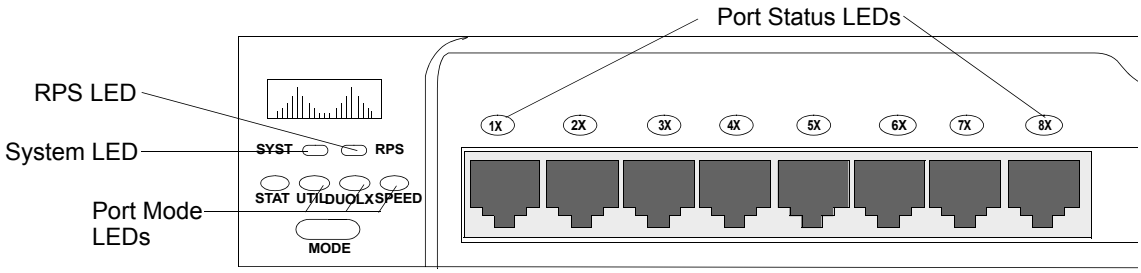

Figure 2-2 Cisco 2950 Switch LEDs

These LEDs indicate the following information:.

Table 2-1. Switch LED Descriptions

LED	Condition/Color	Description
System	Off	Switch is NOT receiving power
	Green	Switch is operating normally
	Amber	Switch is receiving power but is not functioning properly
RPS	Off	RPS is off or is not installed
	Solid Green	RPS is connected and ready to provide backup power
	Blinking Green	RPS is connected but is unavailable because it is providing power to another device.
	Solid Amber	RPS is in standby mode or in a fault condition. Press the Standby/Active button on the RPS and the LED should turn green. If it does not, the RPS fan could have failed.
	Flashing Amber	The internal power supply of the switch has failed, and the RPS is providing power to the switch.

Table 2-2. Port Status LED Diagnostics

LED	Condition/Color	Description
STAT (Port Status)	Off	No link
	Solid Green	Link activity
	Blinking Green	Activity. Port is sending or receiving data
	Alternating Green/Amber	Link fault. CRC errors, and alignment and jabber errors are monitored for link fault. *Note*—If port is configured for 100 Half duplex, the port may show this Condition/Color state. Verify via Network Statistics that there are no other network errors (CRC errors are acceptable as long as no other network errors are present). If network errors are shown in addition to the CRC errors, then there is a data transmission problem.
	Solid Amber	Port is not forwarding.
UTIL (Utilization)	Green	Current backplane utilization
	Amber	Maximum backplane utilization since the switch was powered on
	Green and Amber	
DUPLX (Half or Full Duplex)	Off	Port is operating in half duplex
	Green	Port is operating in full duplex
SPEED	10/100 Ports	
	Off	Port is operating at 10 Mbps
	Green	Port is operating at 100 Mbps
	10/100/1000 Ports	
	Off	Port is operating at 10 Mbps
	Green	Port is operating at 100 Mbps
	Flashing Green	Port is operating at 1000 Mbps

3
Software Description

Cisco 2950

Firmware

The firmware supported on the Cisco 2950 is Version 12.1 (14) EA1a. This is preloaded on the 2950 switch. If the firmware must be reloaded, go to “Reload Firmware” on page 5-3 for the procedure. If the firmware is reloaded, the configuration must also be redone.

Switch configuration

The following describes how to configure the 2950 switch:

Materials required for these procedures are the following:

- **Computer** (workstation, server, or laptop) with the following capabilities:
  - Network Card
  - COM1 port
  - Network Infrastructure Tools CD
  - Cisco Console Cable (blue)
  - Crossover LAN cables (used to connect 2950 switches together)

Step 1. Connect the Cisco console cable to the PC’s COM1 port and to the switch console port.

Step 2. Open a Hyperterminal session with the following COM1 port settings:

Bits per second:	9600
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Xon/Xoff

Step 3. In the Hyperterminal session, select **File -> Properties** and select the **Settings** tab. Click **ASCII Setup** and set the **Line Delay** = **100 milliseconds.**

Step 4. Power up the switch. Verify switch firmware version is 12.1 (14)EA on bootup. If correct, hit **Enter** to get a command prompt. If incorrect, go to “Reload Firmware” on page 5-3.

Step 5. Select, edit, cut and paste the appropriate sections from the configuration files located on the Network Tools CD

a. **Switch Specific Commands**:

- Identify the type of switch (ICN Core1, ICN Tier1, 2, 3, 4, 5, 6, CTS Core1, CTS Core2, CTS Tier1, 2, 3, 4, 5, 6)
- Open the appropriate switch type “short” txt file (e.g. ICN Core1 short.txt, CTS Core1 short.txt, etc.)
- Edit the hostname of the switch, IP Address, and Default Gateway (do not save changes)

  The valid IP Address range for the IntelliVue Clinical Network switches is172.31.**n**.10-172.31.**n**.102 where “**n**” represents the network number and starts at 0 for single clinical network systems. The subnet mask is 255.255.248.0. The default gateway is 172.31.**n**.1

The valid IP Address range for the IntelliVue Telemetry System infrastructure (CTS) switches is172.31.**240**.4-172.31.**240**.20. The subnet mask is 255.255.240.0. The default gateway is 172.31.240.1.

Here is an example of the ICN Core1 switch settings. The lines with the arrows are the ones that must be edited:

```
conf t
hostname Core1
!
spanning-tree vlan 1 priority 4096
!
interface Vlan1
 ip address 172.31.0.10 255.255.248.0
 no ip route-cache
 no shutdown
!
ip default-gateway 172.31.0.1
!
exit
wri mem
```

- Switch> **enable**
  - Enable password is: **m3150e**
- Select the text block, and go to the **Edit** menu -> **Copy**
- Return to the Hyperterminal window, and go to the **Edit** menu -> **Paste to Host**

b. Interface Commands

- Open the **Interfaces.txt** file (use the **interfaces.E01.txt** file for E.01 systems)
- If this switch is to be used in the IntelliVue Wireless Network (as a CTS Core or Tier switch) no port configuration changes are required.
- If the switch is to be used in the IntelliVue Clinical Network, configure the Ports by **EDITING** the range numbers based on the number of devices to be connected.
  - Below is an example of an F.0 switch. The ORIGINAL is the text settings taken directly from the original text file, and the CONFIGURED is one that has been edited and configured for Ports 1-10 for bedside monitors (10Mbps Half Duplex), and Ports 11-20 for Information Centers/Clients/Database Server (100Mbps, Full duplex) and Ports 21-22 for an Edge Switch (Auto):

ORIGINAL

```
config t
!
!Use these settings for Bedside Monitors
!
interface range FastEthernet0/1 -12
```

```
description Bedside Monitor
speed 10
duplex half
!
!
!Use these settings for IIC, Client, DBS, AP and APC
!
interface range FastEthernet0/13 -22
description 100 Mb Full Duplex Device
speed 100
duplex full
!
!
!Use these settings for Allied Telesyn Hubs
!Remove the exclamation point to uncomment the
following lines
!
!interface range FastEthernet0/21 -22
!description Allied Telesyn Hub
!speed auto
end

write memory
```

CONFIGURED

```
config t
!
!Use these settings for Bedside Monitors
!
interface range FastEthernet0/1 -10
description Bedside Monitor
speed 10
duplex half
!
!
!Use these settings for IIC, Client, DBS, AP and APC
!
interface range FastEthernet0/11 -20
description 100 Mb Full Duplex Device
speed 100
duplex full
!
!
!Use these settings for Allied Telesyn Hubs
!Remove the exclamation point to uncomment the
following lines
!
interface range FastEthernet0/21 -22
description Allied Telesyn Hub
speed auto
```

```
end

write memory
```

c. When all edits have been made (desired configuration for all ports entered):

– Verify the switch is still in enable mode (Switch#). If not, type **enable** and **m3150e** as the password.
– Go to the **Edit** menu in notepad **-> Select All -> Copy**
– Return to the Hyperterminal window, and go to the **Edit** menu -> **Paste to Host**

Step 6. Save the configuration settings to the switch

Switch#**copy running-config startup-config**

Step 7. Verify port settings (Speed and Duplex)

Switch#**sho int status**

4
Installation

Network Component Installation

Once the passive LAN cable plant has been installed and certified, the 2950 switch can be installed. These components include switches, repeaters, and media translators and will be located in wiring closets designed for that purpose.

Warning **The switches must be connected to the BATTERY BACKUP outlets of a UPS. Up to 3 Clinical Network components -- switches, repeaters, media translators -- may be connected to a single, 650VA UPS.**

Physical Installation

Switches

Install the switches according to the following steps:

Step 1. Mount the switches securely in their planned location. Mounting hardware for rack or wall mounting is provided with the switches, although they can be placed on a horizontal shelf or table. Refer to the mechanical mounting instructions included with the switch.

Step 2. Install a 650 VA UPS with the proper voltage for each switch as follows:

- **Connect the battery wire** of the UPS.
- **Set the dip switches** of the UPS to their correct settings (if applicable). Refer to the UPS documentation.
- **Turn Off the UPS** On/Off switches.
- **Connect UPS input power cord** to a properly grounded electrical outlet.
- **Connect switch input power cords** to UPS outlets labeled **BATTERY BACKUP**.

5
Troubleshooting the Clinical Network

Overview

Chapter 5 describes the various troubleshooting options for the Clinical Network in the following sections:

Reload Firmware . . . . . page 5-3

Re-configuration . . . . . page 5-8

Network Statistics . . . . . page 5-10

Error Codes and Definitions . . . . . page 5-11

LED Diagnostics . . . . . page 5-12

Maintenance

Network hardware is generally maintenance free. However, the equipment should be kept clean and dry and maintained within its environmental specifications. There are also several routine maintenance procedures that should be followed at regular interval. This section describes those procedures.

Routine Maintenance

For most network components recommended maintenance is described in **User's Manuals** provided with the unit. Refer to those documents for maintenance procedures and frequencies to assure reliable, trouble-free operation.

Note

All **Preventive Maintenance is the responsibility of the customer.**

Recommended frequency is **every 6 months**, or less in harsh environments.

Air Intakes

Fans used to cool electronic devices generally develop dust build-up in air intake areas that must be removed to assure proper cooling and circuit operation. Air intakes of switches should be checked regularly and any dust buildup removed.

Reload Firmware

Materials required for these procedures are the following:

- **Computer** (workstation, server, or laptop) with the following capabilities:
  - Ability to run TFTP software

Caution **The PC used to reload firmware must be capable of running TFTP software.**

  - Network Card
  - COM1 port
- Network Infrastructure Tools CD (contains TFTP Server and IOS image)
- Crossover LAN Cable
- Cisco Console Cable (blue)

Single Switch Firmware restore

Step 1. Install the TFTP software located on the Network Tools CD onto the PC that is to be used to connect to the switch.

Step 2. Open the TFTP software on the configuring PC.

Step 3. Connect the Cisco Console Cable to the **COM1** port on the PC, and to the **Console port** on the switch.

Step 4. Open the **HyperTerminal** application.

Step 5. Click on **Files->Properties** to open the **New Connection Properties** window and click on the **Connect to** tab to display its menu.

Step 6. Click on the **Connect Using** pull down arrow to display its menu.

Step 7. Click on **COM1** or **Direct to COM1**.

Step 8. Click on **Configure** to display the **COM1 Properties** window.

Step 9. Configure the **COM1** port to the following settings:

Bits per second:	9600
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Xon/Xoff

Step 10. Power on the Switch.

Step 11. Click **OK** twice to complete the COM1 port configuration.

It takes about 2 minutes for the switch to reset, during which all port lights turn green.

Step 12. In the **HyperTerminal Window,** press **Enter** to get to the command prompt.

Step 13. Delete the existing startup-config file by typing the following commands (in **bold**):

Switch> **enable**

Enable password is: **m3150e**

Switch# **delete nvram:startup-config**

Confirm the deletion by hitting **Enter**

Switch# **reload**

Confirm the action by hitting **Enter**, do NOT type Y, Router reboots

Switch> **enable**

Enable password is: **m3150e**

Step 14. Setup the switch by typing the following commands (in **bold**):

Switch# **setup**

Starts the System Configuration Dialog, as shown below.

Continue with configuration dialog? [yes/no]: **yes**

Would you like to enter basic management setup? [yes/no]: **yes**

Configuring global parameters:

Enter host name [Switch]: **Switch Name**

Enter enable secret: **m3150e**

Enter enable password: **m3150**

Enter virtual terminal password: **m3150**

Configure SNMP Network Management? [no]: **no**

The Current interface summary displays. Hit the **spacebar** until the entire list is displayed.

Step 15. Configure the interface by typing the following commands (in **bold**)

Enter interface name used to connect to the management network from the above interface summary: **vlan1**

Configuring interface Vlan1:

Configure IP on this interface? [no]: **yes**

IP address for this interface: **172.31.1.1**

Subnet mask for this interface [255.255.0.0]: **255.255.0.0**

Would you like to enable as a cluster command switch? [yes/no]: **no**

Step 16. A configuration command script is shown. Hit the **spacebar** until the entire list is displayed, and the following is shown:

[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: **2**

Configuration completes. Hit **Enter** to return the switch prompt: Switch#

Step 17. Verify the IOS Firmware Version

Switch# **sho version**

Version of IOS Firmware is listed as

System image file is: "flash:/c2950-i6q412-mz.121-14.EA1a.bin

Step 18. If the switch is at Revision Level 12.1(14)EA1, the correct IOS Firmware image is installed. No further action is required. If another revision is listed, continue with this procedure.

Note If the switch is at Revision Level 12.1(14)EA1, the correct IOS Firmware image is installed. No further action is required.

Step 19. Delete the current IOS Firmware Version

Switch# **delete flash:<image name>**

Enter the <image name> that is displayed in the sho version command above. To ensure the image name is copied correctly, select the file name, go to the Edit menu and select Copy, go back to the command prompt and go to the Edit menu and select Paste to Host.

Step 20. Confirm the deletion.

Caution **Do NOT power cycle the switch at this point. As there is no IOS Firmware installed, the power-up tests will fail.**

Step 21. Connect the LAN Cable to the PC and **port 1** on the switch.

Step 22. Verify the TFTP Server software is open and running.

Step 23. Copy the Cisco IOS image file onto the configuring PC (i.e. move into C:\Temp). The file name is "c2950-i6q412-mz.121-14.EA1a.bin"

Step 24. Verify the configuring PC has the correct IP Address and Subnet Mask settings:

IP Address: **172.31.1.20**
Subnet Mask: **255.255.0.0**

Step 25. Open a command window and ping the switch to verify connectivity.

Step 26. Load the new IOS image into the Flash: system by typing the following command into the Hyperterminal window:

copy tftp: c2950-i6q412-mz.121-14.EA1a.bin flash:

Note Take care when entering the IOS Firmware filename. Copy and paste the file name if possible to eliminate typing errors.

a. Enter in the IP Address of your PC: **172.31.1.20**
b. Accept the default Destination filename and Source filename by hitting **ENTER**.
c. Hit **ENTER** at the confirmation "Do you want to overwrite?" The IOS Firmware is being transferred into the switch.

Step 27. After switch reboot, verify the Firmware Version

Switch# **sho version**

Switch to Switch Firmware restore

Transfer the Firmware from one switch (Host switch) with the correct IOS Firmware revision to another switch (Secondary switch). The correct IOS Image is: Version 12.1(19) EA1a and the corresponding binary file name is: **c2950-i6q4l2-mz.121-14.EA1a.bin**

Step 1. Verify the secondary switch has an IP Address configured. If no IP Address is configured, use 172.31.1.100.

Step 2. Make the appropriate connections as shown in Figure 5-1:

a. Connect the switches together using an Ethernet crossover cable.
b. Connect the PC to the console port on the host switch using the Cisco Console cable
c. Ensure that your PC has a valid IP Address (172.31.1.20).

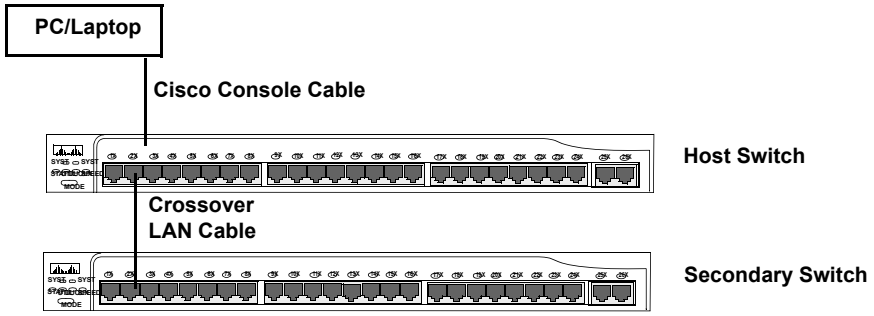

Figure 5-1 Switch to Switch equipment setup

Step 3. Open up a command window (i.e. DOS Window) and telnet to the host router by entering the following command:

telnet 172.31.1.1
(use correct IP address of host switch)

Step 4. Enter the following commands:

Enter password: **m3150**
Switch>**Enable**
Enter enable password: **m3150e**
Switch#**conf t**
Switch[config]#**tftp-server flash:**

Step 5. Open up another command window and telnet to the secondary switch by entering the following command:

telnet 172.31.1.100
(use correct IP address of secondary switch)

Step 6. Enter the following commands:

Enter password: **m3150**
Switch>**Enable**
Enter enable password: **m3150e**

Step 7. Delete the existing IOS Image from the new switch. Enter the following command:

delete flash:*image name*
(e.g. **delete flash:c3550-i5q3l2-mz.121-11.EA1.bin**)

Note To obtain the image name you need to delete, type the directory command (**dir**) at the switch prompt. This lists a series of files and subdirectories currently on the Flash: file system. The file that you need to delete has a name similar to the following and will always be a binary (.bin) file.

a. Delete Flash:*image name*?[confim] **Hit Enter**

Step 8. After the existing IOS image has been deleted, enter the following command to transfer the correct IOS Image from the host switch to the secondary switch:

copy tftp:c2950-i6q4l2-mz.121-14.EA1a.bin flash:

Step 9. Answer the following commands:

Address or name of remote host []? **IP Address of Host switch**

Destination filename [c2950-i6q412-mz.121-14EA1a.bin]?**Hit Enter**

Step 10. Disable the tftp-server and reload the switch. To disable the tftp-server on the existing switch, at the command line on that switch, enter the following command:

Switch[config]#**no tftp-server flash:**

Warning **The switch will be left in a non-secure state if the tftp-server is not disabled.**

Step 11. Exit out of config mode:

Switch[config]#**exit**

Step 12. Save the changes:

Switch#**write mem**

Step 13. Reload the switch:

Switch#**reload**

Proceed with reload?[confirm]**Hit Enter**

Step 14. You have now successfully upgraded the IOS on your new switch. Verify that the new image has been loaded:

a. Open a telnet session with the secondary switch: **telnet 172.31.1.100**
b. Enter password: **m3150**
c. Switch>**sho version**

Re-configuration

Switch configuration

If the firmware is reloaded, the entire configuration must be loaded onto the switch. The following procedure describes how to configure the 2950 switch:

Materials required for these procedures are the following:

- **Computer** (workstation, server, or laptop) with the following capabilities:
  - Network Card
  - COM1 port
  - Network Infrastructure Tools CD
  - Cisco Console Cable (blue)
  - Crossover LAN cables (used to connect 2950 switches together)

Step 1. Connect the Cisco console cable to the PC's COM1 port and to the switch console port.

Step 2. Open a Hyperterminal session with the following COM1 port settings:

Bits per second:	9600
Data bits:	8
Parity:	None
Stop bits:	1
Flow control:	Xon/Xoff

Step 3. In the Hyperterminal session, select **File -> Properties** and select the **Settings** tab. Click **ASCII Setup** and set the **Line Delay** = **100 milliseconds.**

Step 4. Power up the switch. After the startup sequence, hit **Enter** to get a command prompt. Enter the following commands in **bold**:

Switch>**Enable**

Switch#**delete nvram:startup-config**

Delete filename [startup-config]?**Hit Enter**

Delete nvram:startup-config?[confirm]**Hit Enter**

Switch#**reload**

Proceed with reload?[confirm]**Hit Enter**

Step 5. After the switch reloads, hit **Enter** and the prompt appears. Enter the following commands:

Switch>**Enable**

Enter enable password: **m3150e**

Switch#

Note Do not close the Hyperterminal window. You will return to it momentarily.

Step 6. Select, edit, cut and paste the appropriate sections from the configuration files located on the Network Tools CD

a. **Common Commands**:

- Open the **Common.txt** file on the Network CD
- Select all the text and go to the **Edit** menu -> **Copy**
- Return to the Hyperterminal window, and go to the **Edit** menu -> **Paste to Host**

Step 7. Follow the procedure in “Switch configuration” on page 3-1 to complete the configuration.

Network Statistics

The **Network Statistics** tool provides access to operational information from switches and access points on the Clinical Network. This information allows service personnel to determine if network switches and access points are operating within normal bounds, troubleshoot network component failures, and correlate observed application events to network communication problems. Network Statistics runs in monitoring mode and is available on the Server and all Clinical Network connected Information Centers and Clients.

Warning **Do Not Load any other network management software on the system - it will adversely affect system performance and may result in loss of monitoring.**

Clicking on **Network Statistics** in the Support Logs menu in the Service window brings up the **Network Statistics** window. Click on **Switches.**

To access the Cisco 2950 browser to view configuration settings:

Step 1. Select the switch in the drop-down list.

Step 2. In the login dialog box type in the switch hostname as the User and **m3150e** as the password.

Step 3. To view the port settings, click on **Tools** in the left frame, then click on **Show Interfaces**. The ports and their settings display.

Error Codes and Definitions

Incrementing Counter Errors

Table 5-1. Incrementing Counter Errors

Counter	Definition	Cause of Incrementing Counters
Alignment Errors	Alignment errors are a count of the number of frames received that do not end with an even number of octets and have a bad CRC	Result of collisions at half-duplex, duplex mismatch, bad hardware (NIC, cable, or port) or a connected device generating frames that do not end with on an octet and have a bad FCS
FCS	FCS error count is the number of frames that were transmitted or received with a bad checksum (CRC value) in the Ethernet frame. These frames are dropped and not propagated onto other ports.	Result of collisions at half-duplex, duplex mismatch, bad hardware (NIC, cable, or port) or a connected device generating frames with bad FCS
Smut-Err	This is an indication that the internal transmit buffer is full.	Indication of excessive input rates of traffic. This is also an indication of transmit buffer being full. The counter should only increment in situations in which the switch is unable to forward out the port at a desired rate. Situations such as excessive collisions and 10MB ports cause the transmit buffer to become full.
Rcv-Err	This is an indication that the receive buffer is full	Indication of excessive output rates of traffic. This is also an indication of the receive buffer being full. This counter should be zero unless there is excessive traffic through the switch.
UnderSize	These are frames that are smaller than 64 bytes (including FCS) and have a good FCS value	Indication of a bad frame generated by the connected device.
Single Collisions	Number of times the transmitting port had one collision before successfully transmitting the frame to the media	Indication of a half-duplex configuration (normal for half duplex)
Multiple Collisions	Number of times the transmitting port had more than one collision before successfully transmitting the frame to the media	Indication of a half-duplex configuration (normal for half duplex)
Late Collisions	Two devices transmit at the same time and neither side of the connection detects a collision. The time to propagate the signal from one end of the network to another is longer than the time to put the entire packet on the network. The two devices that cause the late collision never see that the other is sending until after it puts the entire packet on the network. Late collisions are detected by the transmitter after the first time slot of the 64 byte transmit time occurs. They are only detected during transmissions of packets longer than 64 bytes. Its detection is exactly the same as it is for a normal collision; it just happens later than it does for a normal collision.	Indication of faulty hardware (NIC, cable or switch port) or a duplex mismatch
Excessive Collisions	Number of frames dropped after 16 attempts to send the packet resulted in 16 collisions	Indication of over utilization of the switch port at half-duplex or duplex mismatch
Carrier Sense	Occurs every time an Ethernet controller wants to send data and the counter is incriminated when there is an error in the process.	Indication of faulty hardware (NIC, cable or switch port)
Runts	Frames smaller than 64 bytes with a bad FCS value	Indication of the result of collisions, possible duplex mismatch
Giants	Frames that are greater than 1518 bytes and have a bad FCS value	Indication of faulty hardware

LED Diagnostics

When investigating signal flow, many hardware components have diagnostic LEDs that can be used to determine whether they are functioning properly and are receiving and passing data. See “Controls and Indicators” on page 2-2

6
Testing Product Assurance

Testing Product Assurance

Before using the Information Center system clinically with patients, proper performance of the system should be verified. This section includes a series of **Product Assurance Tests** that should be performed after system installation and any system repair or upgrade to verify system functionality.

Notes

These validation tests do not check all system specifications but are intended to verify performance of the primary features of Information Center functionality. However, successful completion of the performance tests should yield a fully functioning system.

When performing product assurance tests, Information Centers must be connected to the SDN or Clinical Network.

Visual Tests

Prior to using the Philips system with patients, all system components, cables, and connectors should be thoroughly visually inspected.

System Components

Step 1. Check all components of the Information Center system for signs of mechanical damage.

If damage to a component is found, assess the damage to determine if repair or replacement is required. Repair or replace the component as required before continuing the Product Assurance Tests.

Cables

Step 2. Check all cables of the Information Center system for signs of abrasion, wear, or other damage.

If any cable shows evidence of damage, repair or replace the cable prior to using the Information Center system for patient monitoring.

Connectors

Step 3. Check all cable connectors for signs of mechanical damage and each cable connection for connection integrity.

If any cable connector shows signs of damage, replace the cable prior to using the Information Center system for patient monitoring.

Step 4. Check that all cable connectors are securely fastened to the rear of each device.

Test and Inspection Procedures

This section is intended for **Philips Cardiac and Monitoring Systems Service Providers**. It documents requirements for test, inspection, and reporting of results for Information Center systems to help assure safe and reliable operation.

Note The tests and inspections in these tables ***must be followed*** **by Philips Service Providers** when the Philips system is installed and after any service event.

Table 6-2 describes which tests should be performed for Philips system components -- Information Centers, Clients, Database Servers, Clinical Network components -- for each type of service event.

Table 6-2. Cisco 2950 Test and Inspection Requirements

Service Event When performing....	Test Block(s) Required ....Complete these tests
Installation	Visual, Power On
Preventive Maintenance	Power On
Any component repair or replacement	Power On
Hardware Upgrade	Power On
Software Upgrade	Power On
All other Service Events	Visual, Power On

Clinical Network

Table 6-3 describes the test or inspection to perform for **active M3185 Clinical Network components** for each type of test specified in Table 6-2.

Table 6-3. Cisco 2950 - Test and Inspection Matrix

Test Block Name	Test or Inspection to Perform	Expected Results	What to Record on Service Record
Visual	Inspect all system components for obvious damage.	No visible damage	**V:P** or **V:F** where **P** = Pass **F** = Fail
Power On:	With power connected to each active Network device, observe that all lights visible on the front panel are in proper status and that no error conditions are shown. Following are **normal conditions** for each type of device: Cisco 2950 Port Switches: After self test, the **System** LED is solid green and all of the **Port Status** LEDs are **Off** (nothing is connected to the front panel.)	Devices power up into expected status; no error indications are shown.	**PO:P** or **PO:F** where **P** = Pass **F** = Fail
Performance:	No safety test is required		**P:NA** where **NA** = Not required
Safety	No safety test is required		**S:NA** where **NA** = Not required